

REMARKSStatus of the Claims

Claims 1-22 are pending in the application and have been examined. Applicant hereby amends claims 1, 2, 6-9, 11-14, 18 and 20 and adds new claims 23-41. Accordingly, after entry of this paper claims 1-41 will be considered for examination.

Claim Amendments and New Claims

Applicant submits that the claim amendments and new claims add no new matter. Specifically, support for the amendments to claims 1, 2, 6-9, 11-14, 18, and 20, and new claims 23-41 is found at least as follows. Support for amended claims 1, 2, 8, and 20 new claims 23, 24, 26, 28-30, 32, 34-37, 39 and 41 can be found at least at page 24, line 9 to page 29, line 5, Table 3, Table 4 and Examples 6-10, and accompanying text. Support for amended claims 6, 7, 9 can be found at least in Table 3 and Examples 6-10 and accompanying text.

Claims 11-14 have been amended to further clarify the claims and claim 18 has been amended to correct an inadvertent clerical and typographical error. Accordingly, Applicant submits that no new matter has been added.

Support for new claims 25, 27, 31, 33, 38 and 40 can be found at least in Table 4 and accompanying text.

Rejections under 35 U.S.C. § 112, second paragraph

Claims 6, 7, 9, 13 and 15 were rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite. Applicant has amended these claims to correct inadvertent typographical and clerical errors and further clarify these claims. Accordingly, Applicant submits that amended claims 6, 7, 9, 13 and 15 meet the requirements of 35 U.S.C. § 112, second paragraph.

Rejections under 35 U.S.C. § 103

Claims 1-22 were rejected under 35 U.S.C. §103 as allegedly obvious over U.S. Patent Number 5,204,393 to Nalepa. ("Nalepa") in view of European Patent Application Publication No. EP 0618 225 A1 by Bolthouse et al. ("Bolthouse"). Applicant submits that neither Nalepa nor Bolthouse, either alone or in combination, teach or suggest all elements of Applicant's

claims. With regard to amended independent claims 1 and 2, both Nalepa and Bolthouse fail to teach,

A battery casing ... formed of a flame retardant thermoplastic composition comprising ... a homopolymer, a copolymer, and a phosphate salt, the battery casing having a burn rating of V-O under the UL-94 standard and a flexural modulus greater than about 250,000 psi.

as set forth in Applicant's amended claims 1 and 2. (Emphasis added)

Although Nalepa mentions the use of an ammonium polyphosphate (APP) flame retardant in his polymer compositions, it is not inherent that the compositions of Nalepa have a flexural modulus of greater than about 250,000 psi and a UL-94 rating of V-O because the flame retardant of Nalepa also invariably includes tris(2-hydroxyethyl) isocyanurate (THEIC) and melamine cyanurate (MC). (See, e.g., Nalepa, col. 3, lines 5-21) In fact, Nalepa teaches away from anything less than a combination of APP, THEIC and MC. (See, e.g., Nalepa, col. 2, lines 32-35 (describing problems with use of APP and THEIC alone), col. 3, line 65, to col. 4, line 20 (describing loading of APP/THEIC/MC combination believed necessary to obtain V-O rating).

As is known in the art, the addition of flame-retardants typically undermine the physical and mechanical properties of a plastic material. As a result, the compositions of Nalepa, which require a combination of three flame retardants (APP, THEIC and MC), can not be said to inherently produce a thermoplastic composition with a flexural modulus of greater than about 250,000 psi and a UL-94 rating of V-O as set forth in Applicant's claims.

Applicant further submits that Bolthouse fails to cure the deficiencies in Nalepa. Specifically, Bolthouse also fails to teach or suggest a thermoplastic composition having "a burn rating of V-O under the UL-94 standard and a flexural modulus greater than about 250,000 psi" as set forth in Applicant's amended claims 1 and 2. Rather, the highest flexural modulus of the V-O rated compositions of Bolthouse is 241,000 psi. (See, e.g., Bolthouse Table 1) Accordingly, it can not be said that Bolthouse teaches or suggests a thermoplastic composition with a flexural modulus of greater than about 250,000 psi and a UL-94 rating of V-O as set forth in Applicant's claims. Therefore, Applicant respectfully submits that Nalepa and Bolthouse, either alone or in combination, fail to teach or suggest every element of Applicant's amended independent claims 1 and 2, or dependent claims 3-19 and 23-34, each of which ultimately depends from either allowable amended base claim 1 or 2.

For the reasons set forth above, Applicant also submits that Nalepa and Bolthouse, either alone or in combination, fail to teach or suggest every element of Applicant's amended claim 20. Specifically, both Nalepa and Bolthouse fail to teach,

A method for forming a flame-retardant composition for a battery casing ... the composition having a melt flow rate in the range from about 9.6 to about 16.0g/10min., a burn rating of V-O under the UL-94 standard and a flexural modulus greater than about 250,000 psi

as set forth in amended claim 20. (Emphasis added) As set forth above, Nalepa does not describe either thermoplastic compositions with a flexural modulus of greater than about 250,000 psi and a UL-94 rating of V-O as set forth in Applicant's claims or a method of producing compositions with such physical properties. Nor can it be said that the compositions of Nalepa inherently produce a plastic with these physical properties because of the three component flame-retardant system (APP/THEIC/MC) required by Nalepa.

Similarly, Bolthouse does not teach or describe methods of producing compositions with a burn rating of V-O under the UL-94 standard and a flexural modulus greater than about 250,000 psi as set forth in Applicant's amended claim 20 because none of the V-O rated compositions of Bolthouse have a flexural modulus above 241,000 psi. Therefore, Applicant respectfully submits that Nalepa and Bolthouse, either alone or in combination, fail to teach or suggest every element of Applicant's amended independent claim 20 or dependent claims 21 and 22, which depend therefrom.

With regard to new claims 35-41, Applicant submits that these claims are novel and non-obvious over the applied references Nalepa and Bolthouse. Applicant submits that neither Nalepa nor Bolthouse describe,

A battery casing ...formed of a flame retardant thermoplastic composition ... having a specific gravity less than about 1.25 and the battery casing having a burn rating of V-O under the UL-94 standard and a flexural modulus greater than about 228,000 psi

as set forth in new claim 35. (Emphasis added). For example, Bolthouse does not describe a composition with a specific gravity below 1.47. (See, Bolthouse Tables 1 and 2)

CONCLUSION

In view of the above, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone call would serve to clarify issues or expedite the prosecution of this case, the Examiner is invited to call the undersigned at (508) 416-2475.

Respectfully submitted,
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MARKED UP VERSION OF AMENDMENTSSpecification Amendments Under 37 C.F. R. § 1.121(b)(1)(iii)

Please replace the page 28 (Table 4), with the following page (Table 4):

TABLE 4

Property	Test	Units	Ex [1]6	Ex[2]7	Ex [3]8	Ex [4]9	Ex[5] 10
Specific Gravity	ASTM D1505		1.04	1.02	1.02	1.02	1.02
Melt Flow Rate	ASTM D1238	g/10 min	15.0	9.6	12.0	16.0	15.0
Tensile Strength	ASTM D638	psi	2840	2500	2300	2700	2400
Yield Strength	ASTM D638	psi	2840	3000	2600	3200	2900
Elongation	ASTM	%	200	40	150	90	80
Burn Rating 1/32"-1/8"	UL-94		V-0	V-0	V-0	V-0	V-0
Oxygen Index	ASTM D2863	%	29.0	29.0	29.0	28.0	29.0
Gardner Impact	ASTM D3029	ft-lb/in.	12.0	15.0	15.0	14.0	16.0
Izod Impact, notched	ASTM D256	ft-lb	1.1	0.9	0.8	0.7	0.9
Flexural Modulus	ASTM 790	psi	228,000	263,000	275,000	260,000	270,000
Dielectric Constant (1kHz), 23°C	ASTM D1531		2.45	2.40	2.38	2.42	2.48

Claim Amendments Under 37 C.F.R. § 1.121(c)(1)(ii)

1. (Amended) [(Amended)] A battery casing comprising:
 - a) a bottom portion having a bottom and side walls forming a compartment for holding a battery acid and battery plates; and
 - b) a top portion for covering said compartment, wherein the bottom portion and top portion are formed of a flame retardant thermoplastic composition comprising a homopolymer, a copolymer, and [ammonium] a [poly] phosphate salt, the battery casing having a burn rating of V-O under the UL-94 standard and a flexural modulus greater than about 250,000 psi [in the range of 228,000 to 275,000].
2. (Amended) [(Amended)] A battery casing formed of a flame-retardant thermoplastic composition, comprising:
 - a homopolymer;
 - a copolymer; and
 - a [ammonium poly]phosphate salt, the battery casing having a burn rating of V-O under the UL-94 standard and a flexural modulus greater than about 250,000 psi [in the range of 228,000 to 275,000].
6. (Amended) The battery casing of Claim 2 wherein the homopolymer of the composition is in a range from [of between] about 33 to about [and 35] 37 percent by weight of the total weight of the thermoplastic composition.
7. (Amended) The battery casing Claim 2 wherein the copolymer of the composition is in a range from [of between] about 33 to about [and 35] 37 percent by weight of the total weight of the thermoplastic composition.
8. (Amended) [(Amended)] The battery casing of Claim 2 wherein the ammonium polyphosphate comprises a flame-retardant systems having a melt flow rate in the range of 12.0 to 16.0g/10 min.

9. (Amended) The battery casing of Claim 2 wherein the ammonium polyphosphate is in the range [of between] about 22 [25 and 27] to about 29 percent by weight of the total weight of the thermoplastic composition.
11. (Amended) [(Amended)] The battery casing of Claim 2 wherein the homopolymer and copolymer comprise a crystalline product formed by polymerization of one or more monoolefins [selected] from the group consisting of ethylene, propylene, 1-butene, 1-pentene, 1-hexene, 2-methyl-1-propene, 3-methyl-1-pentene, 4-methyl-1-pentene, and 5-methyl-1-hexene.
12. (Amended) The battery casing of Claim 11 wherein monoolefins are [selected] from the group consisting of propylene and ethylene.
13. (Amended) The battery casing of Claim 12 wherein the polymerized polypropylene [is selected] comprises a polymer from the group consisting of isotactic polymers of propylene, ethylene, and copolymers of propylene with ethylene.
15. (Amended) The battery casing of Claim 14 wherein said filler varies from about 0.5-250 parts per 100 parts of the homopolymer and copolymer.
18. (Amended) The battery casing of Claim 2 which is included in an automotive battery.
20. (Amended) [(Amended)] A method for forming a flame-retardant composition for a battery casing comprising blending a homopolymer, copolymer and [ammonium polyphosphate] a phosphate salt together at a temperature in a range [of between] from about 340 to about [and] 410°F to form the flame retardant composition, the composition having a melt flow rate in the range [of] from about 9.6 to about 16.0g/10min., a burn rating of V-O under the UL-94 standard and a flexural modulus greater than about 250,000 psi [and flexural modulus in the range of 228,000 to 275,000].